

# Technology Readiness Assessment Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

## Waste Treatment and Immobilization Plant (WTP) HLW Waste Vitrification Facility

### Why DOE-EM Did This Review



HLW Waste Vitrification Facility

DOE is constructing a Waste Treatment and Immobilization Plant (WTP) at Hanford to treat the site's tank wastes. The WTP is composed of several facilities including a High-Level Waste Vitrification Facility (HLW). The purpose of this assessment was to identify the critical technology elements (CTEs) in the HLW and determine if these are sufficiently mature to be incorporated into the final WTP design, which normally requires a Technology Readiness Level of 6.

### What the TRA Team Found

The assessment team identified the following CTEs, along with each element's Technology Readiness Level (TRL) for the HLW facilities:

- HLW Melter Feed Process System (TRL=6)
- HLW Melter Process System (TRL=6)
- HLW Melter Offgas Treatment Process System/Process Vessel Vent System (TRL=5)
- Pulse Jet Mixer System/Rad Liquid Waste Disposal System (TRL=4)

The assessment team concluded that the CTEs of the HLW Vitrification Facility are sufficiently mature to continue to advance the final design.

### What the TRA Team Recommended

The assessment team recommended the following:

- Testing the prototype HLW film cooler and film cooler cleaner to demonstrate the adequacy of the equipment in a melter equipped with bubblers (bubbling increases likelihood of fouling and blockages in the cooler) prior to cold commissioning. Additional tests to better understand the conditions (feed concentrations, bubbling rate, bubbler locations, etc.) that increase film cooler blockages would be useful.
- Testing and analysis of the Wet Electrostatic Precipitator (WESP) to demonstrate equipment adequacy (WESP electrode power) when processing Hanford wastes and evaluating the corrosion resistance of the 6% molybdenum stainless steel internals of the WESP.
- Testing activated carbon bed for behavior when contacted with organics, acids (NO<sub>x</sub>, SO<sub>x</sub>, halogens), sulfur and mercury.
- Testing the pulse jet mixers for dissipating gases, blending liquids, and suspending solids. Specific requirements for pulse jet mixing should be established.

To view the full TRA reports, please visit this web site:  
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

TRA Summary: August 2011

*The objective of a Technology Readiness Assessment (TRA) is to determine the maturity of certain key technologies, identified as Critical Technology Elements (CTEs), using a systematic, metric-based process and to evaluate the readiness of these technologies for insertion into a project design.*



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